REMARKS

This is a full and timely response to the outstanding non-final Office Action mailed September 19, 2006. The Examiner is thanked for the thorough examination of the present application. Upon entry of this response, claims 1-20 are pending in the present application. Claims 1-15 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by *Terry* (U.S. Pat. No. 6,055,297). Applicants have added new claims 16-20 and have amended claims 1 and 13. Applicants respectfully request consideration of the following remarks contained herein. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

I. **Response to Claim Rejections Under 35 U.S.C. § 102(b)**

Claims 1-15 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by *Terry*. For at least the reasons set forth below, Applicants traverse these rejections.

Independent Claim 1 is Patentable Over Terry

Claim 1 has been amended only to correct a minor typographical error. Regarding the §102 rejection, Applicants respectfully submit that independent claim 1 patently defines over *Terry* for at least the reason that *Terry* fails to disclose, teach or suggest certain features in claim 1.

Claim 1 recites:

> 1. *A method for __multiple inputs, multiple outputs (MIMO)__ power spectral density (PSD) allocation in a digital subscriber line (DSL) system, the method comprising:*
> __*monitoring system performance by performing a multi-ended line test (MELT)*__;

> processing the MELT; and
> allocating PSD based on at least one of system coupling power and
system traffic.

(*Emphasis added*.) Applicants respectfully submit that the *Terry* reference does not

teach of all the features emphasized in claim 1 above and that there is a basic

distinction between the *Terry* reference and claim 1. This distinction relates to MIMO

allocation of PSD as recited in claim 1.

As reflected above, claim 1 recites, "A method for multiple inputs, multiple

outputs (MIMO) power spectral density (PSD) allocation in a digital subscriber line

(DSL) system." As described in the summary section of the present application, the

various embodiments relate to techniques that dynamically allocate power and spectral

densities to a downstream (DS) network in a centralized manner through MIMO

allocation of PSD. This approach makes better use of the fixed global power available

for the whole DSLAM. Furthermore, as indicated above, claim 1 recites the feature,

"monitoring system performance by performing a multi-ended line test (MELT)."

In contrast, *Terry* does not appear to relate to MIMO (multiple-input/multiple-

output) allocation of PSD. *Terry* instead teaches of individual modems monitoring the

crosstalk between adjacent lines. In this regard, *Terry* describes:

> During one or more such monitoring periods, in each of the
> modems 12 and 14, separately or simultaneously, the modem
> receiver performs a spectral analysis of any signals that may be
> received via the line 10.

(*Emphasis added;* Col. 6, lines 23-26)

> Thus each of the modems 12 and 14 can determine not only
> the extent of crosstalk between the line 10 and any other lines 16
> and 22, but also, from a comparison of the monitored power
> spectrum with stored templates of power spectra for various

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> systems, suitably modified to take into account the known NEXT frequency characteristics of the twisted pair cable, the type of communications system predominantly contributing to such crosstalk. <u>Each of the modems 12 and 14 then adjusts the power spectral density (PSD) for signals that it will transmit to the line 10</u> to minimize overlap with the PSD of signals for the opposite direction of transmission for any determined communications system contributing to the monitored NEXT.

(*Emphasis added;* Col. 6, lines 39-51)

While *Terry* teaches that the modems may determine the crosstalk between multiple lines, Applicants submit that this is not equivalent to MIMO allocation of PSD. As further described in the summary section of the present invention, an exemplary technique of the present invention is to allocate power/PSD in a multiple input, multiple output (MIMO) manner instead of a single input, single output (SISO) manner. In typical DSL systems, power and <u>PSD are allocated on a pair-to-pair basis</u>. Thus, power and PSD are typically allocated in a single input, single output (SISO) fashion. Accordingly, in SISO systems it is not possible to reallocate power or PSD to compensate for increased (or decreased) demand on one or more of the systems. This can lead to system inefficiencies.

Accordingly, Applicants respectfully submit that independent claim 1 patently defines over *Terry* for at least the reason that *Terry* fails to disclose, teach or suggest the highlighted features in claim 1 above.

Dependent Claims 2-12 are Patentable Over Terry

Because independent claim 1 patently defines over *Terry*, dependent claims 2-12 are allowable over *Terry* as a matter of law for at least the reason that these claims

contain all the features and elements of their corresponding independent claim. *See,*

e.g., In re Fine, 837 F. 2d 1071 (Fed. Cir. 1988).

Independent Claim 13 is Patentable Over Terry

Applicants respectfully submit that independent claim 13 patently defines over

Terry for at least the reason that *Terry* fails to disclose, teach or suggest certain

features in claim 13.

Claim 13, as amended, recites:

13. A system for dynamically monitoring and allocating upstream
and downstream power spectral density (PSD) of a transceiver set, the
system comprising:
a monitor for performing multi-ended line tests (MELT);
a controller, responsive to the monitor, ***for performing multiple
inputs, multiple outputs (MIMO) dynamic PSD allocation of upstream
and downstream PSD***; and
a table of upstream PSD and downstream PSD for each time (t)
and each line.

(*Emphasis added.*) Applicants respectfully submit that the *Terry* reference does not

teach of all the features taught in claim 13, as amended. Applicants have amended

claim 13 only to clarify certain novel features taught in the claim and submit that no new

subject matter is added.

The amendments to claim 13 were made to clarify that there is a basic distinction

between the *Terry* reference and claim 13. This distinction relates to MIMO allocation of

PSD. As described in the summary section of the present invention, the various

embodiments relate to techniques that dynamically allocate power and spectral

densities to a downstream (DS) network in a centralized manner. For some

embodiments, the dynamically centralized allocation procedure may handle the spectral

compatibility among different DSL systems. Claim 13 recites the following feature: "performing multiple inputs, multiple outputs (MIMO) dynamic PSD allocation of upstream and downstream PSD." In contrast, *Terry* does not appear to relate to MIMO allocation. Instead, *Terry* teaches of individual <u>modems</u> monitoring the crosstalk between adjacent lines.

As described in the summary section of the present invention, an exemplary technique of the present invention is to allocate power/PSD in a multiple input, multiple output (MIMO) manner instead of a single input, single output (SISO) manner. In typical DSL systems, power and <u>PSD are allocated on a pair-to-pair basis</u>. Thus, power and PSD are typically allocated in a single input, single output (SISO) fashion. Accordingly, in SISO systems it is not possible to reallocate power or PSD to compensate for increased (or decreased) demand on one or more of the systems. This can lead to system inefficiencies.

Accordingly, Applicants respectfully submit that independent claim 13 patently defines over *Terry* for at least the reason that *Terry* fails to disclose, teach or suggest the highlighted features in claim 13 above.

Dependent Claims 14-15 are Patentable Over Terry

Because independent claim 13 patently defines over *Terry*, dependent claims 14-15 are allowable over *Terry* as a matter of law for at least the reason that these claims contain all the features and elements of their corresponding independent claim. *See, e.g., In re Fine*, 837 F. 2d 1071 (Fed. Cir. 1988).

Newly Added Claims

Applicant submits that new claims 16-20 are allowable over the cited references. Specifically, independent claim 16 is allowable for at least the reason that the cited reference does not teach, disclose, or suggest the feature of "a controller, for performing MIMO dynamic allocation of upstream and downstream PSD for the components within the DSL system, wherein the controller is responsive to at least one of the monitor and a priori knowledge received from components within the DSL system." Furthermore, dependent claims 17-20 are allowable over the cited reference for at least the reason the claims depend from an allowable claim (claim 16). *See, e.g., In re Fine*, 837 F. 2d 1071 (Fed. Cir. 1988). Therefore, Applicant requests the Examiner to enter and allow the above new claims.

II.   Prior Art Made of Record

The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

CONCLUSION

Applicants respectfully submit that all pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephone conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

A credit card authorization is provided to cover the fee for the accompanying petition for extension of time. No additional fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

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